

## CLAIMS

What is claimed is:

1. A connection between a pair of components comprising:  
5 a male component having an array of bumps;  
a female component having a matching array of wells;  
bonding material in said wells; and  
wherein each of said bumps extends into its matching well and bonds with said bonding material to form a connection to said female component.
- 10 2. The connection of claim 1 wherein said bumps are gold stud bumps.
3. The connection of claim 1 wherein said bonding material is solder.
4. The connection of claim 1 wherein said components are alignment sensitive.
5. The connection of claim 1 wherein said wells are spaced apart with a pitch of less than 200 microns.
- 15 6. The connection of claim 3 wherein said male component or said female component is an electrical component.
7. The connection of claim 3 wherein said solder is indium-based.
8. The connection of claim 6 wherein one of said electrical component is an integrated circuit chip.
- 20 9. The connection of claim 6 wherein one of said electrical component is a module access cable.
10. The connection of claim 6 wherein one of said electrical component is an interconnection circuit.
- 25 11. A method for connecting a pair of components comprising the steps of:  
providing an array of bumps on a male component;  
providing a matching array of wells in a female component;

filling said wells with bonding material;  
aligning said male and female components and inserting said bumps in said wells; and,  
activating said bonding material to attach said female component to said male  
component.

5    12.    The method of claim 10 wherein said bonding material is deposited in said wells using a  
squeegee.

13.    A method for aligning a pair of components comprising the steps of:  
providing an array of bumps on a male component;  
providing a matching array of wells in a female component;  
10    filling said wells with bonding material;  
positioning said female and male components relative to one another and inserting said  
bumps in said wells;  
monitoring an alignment-sensitive performance parameter for the combined components;  
optimizing said positioning by maximizing said performance parameter; and,  
15    bonding said bumps to said wells using said bonding material.